# GCSE Maths: Exam-Style Booklet

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*This exam booklet covers topics intended for the 2024 iGCSE exam diet. It is still largely suitable for students on other exam boards. For solutions and marking email fredserdickinson@gmail.com. Good luck!*

Give your solutions on a separate piece of paper or digital notebook. Attempt to answer all questions and make your workings clear. You may use a calculator.

1. (a) Write $x^2 + 10x + 3$ in the form $(x + a)^2 + b$ where $a$ and $b$ are integers. (3)

   (b) Hence, or otherwise, give the coordinates of the turning point of the graph $y = x^2 + 10x + 3$. (1)

2. (a) Factorise $x^2 - 4x - 21$. (1)

   (b) Hence, or otherwise, solve (2)

$$\frac{x^2 - 4x - 21}{x + 3} = x^2 - 37.$$

3. (a) Write $\sqrt{50}$ in the form $k\sqrt{2}$, where $k$ is an integer. (1)

   (b) Show that (3)

$$\frac{5 + 2\sqrt{3}}{2 + \sqrt{3}}$$

   can be written in the form $a + b\sqrt{3}$, stating your values of $a$ and $b$.

4. Solve $3x^2 - 11x - 13 = 0$. Give your solutions correct to 3 significant figures. (2)

5. (a) A line $L_1$ is shown in the figure below. It passes through points $A(0, 3)$ and $B(6, 0)$.

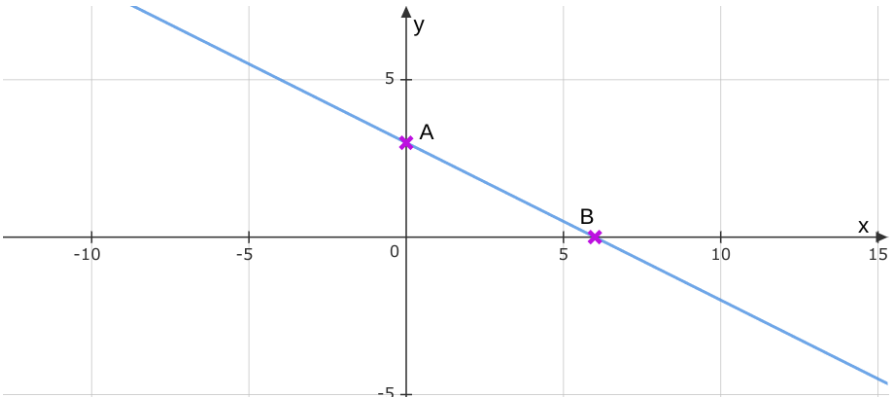


Figure 1: The graph of some straight line $L_1$.

i. Find the equation of the line $L_1$. (2)

ii. The midpoint of the line segment between $A$ and $B$ is denoted $C$. Find the coordinates of $C$. (1)

(b) A second line $L_2$ is perpendicular to $L_1$ and passes through the point $C$. Find the equation of $L_2$. (3)

6. Jeffrey has a bag containing a selection of red, green and blue marbles. There are 16 blue marbles in the bag and the number of red and green marbles are split in the ratio $4 : 2$. (4)

Jeffrey puts his hand into the bag and selects a marble at random. Given that the chance he picks a blue marble is 25%, how many green marbles are in the bag?

7. Solve the following system of simultaneous equations (5)

$$x^2 + y^2 = 34$$
$$x - y = 2,$$

stating clearly your solutions for $x$ and $y$.

8. The triangle $ABC$ has been drawn in the figure below. Find the angle $\angle ABC$, fully justifying your answer. (2)

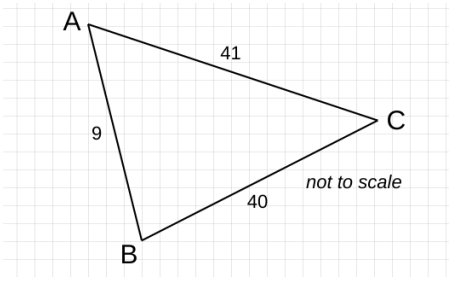


Figure 2: The triangle $ABC$, drawn not to scale.

9. Jack's football team is having a mass bake sale. Arthur bought 7 cookies and 3 brownies for a total cost of 31.25. Louis bought 2 cookies and 8 brownies for a total cost of 25.

   (a) What is the individual cost of both items? (4)

   (b) Lewis bought 15 cookies and 20 brownies to share with his class. How much did he pay? (1)

10. Consider the triangle $ABC$ drawn below.

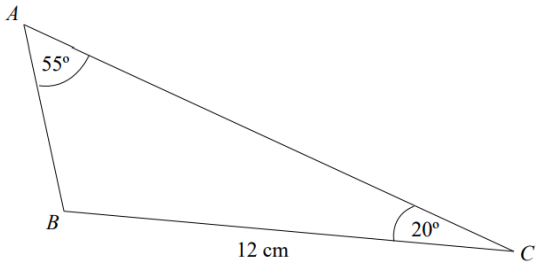


Figure 3: Some other triangle $ABC$, drawn not to scale.

   (a) Find the length $AC$. (3)

   (b) Hence, or otherwise, find the area of the triangle $ABC$. (2)

# END OF EXAM BOOKLET.